# Vehicle Interior Noise Prediction Using Energy Finite Element Analysis, Phase I

Completed Technology Project (2004 - 2004)

## Project Introduction

Prediction and enhancement of vehicle interior noise due to high frequency excitation, based on computer simulation, allows the application of the technology at the early stage of design process thereby improving the quality and reducing the cost. Traditionally, Statistical Energy Analysis (SEA) has been used for this purpose. Modeling of SEA is rather complex and requires high level of analyst expertise as well as occasional testing of the product's components. In this proposal, a comprehensive Energy Finite Element Analysis (EFEA) software will be developed for the evaluation of vehicle interior noise. Since the low frequency noise and vibration modeling is traditionally performed using finite element method, the development of an EFEA software will provide a unified framework for the both the low and high frequency noise and vibration analyses.

## Primary U.S. Work Locations and Key Partners
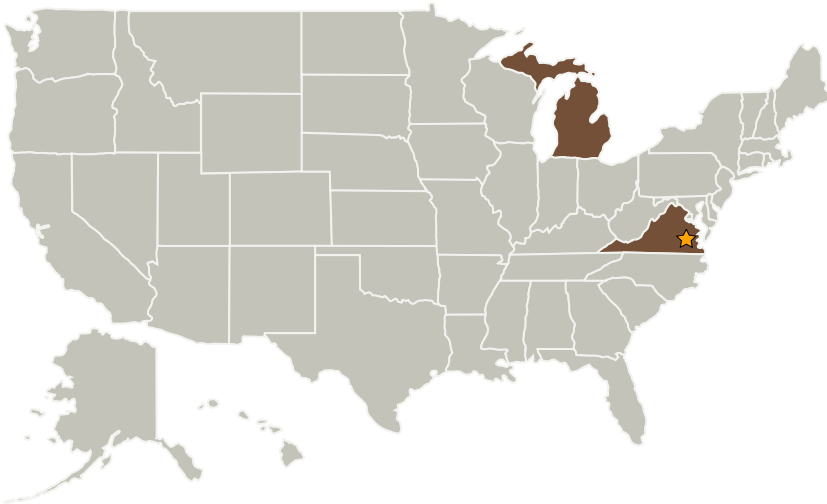


| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ⭐Langley Research Center(LaRC) | Lead Organization | NASA Center | Hampton, Virginia |
| Comet Technology Corporation | Supporting Organization | Industry | Ann Arbor, Michigan |



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## Table of Contents

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

For more information and an accessible alternative, please visit:
https://techport.nasa.gov/view/5367

| Primary U.S. Work Locations | |
|---|---|
| Michigan | Virginia |

## Project Management

**Program Director:**
Jason L Kessler

**Program Manager:**
Carlos Torrez

**Principal Investigator:**
Satha Raveendra

## Technology Areas

**Primary:**

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  └ TX12.5 Structural Dynamics
    └ TX12.5.2 Vibroacoustics